

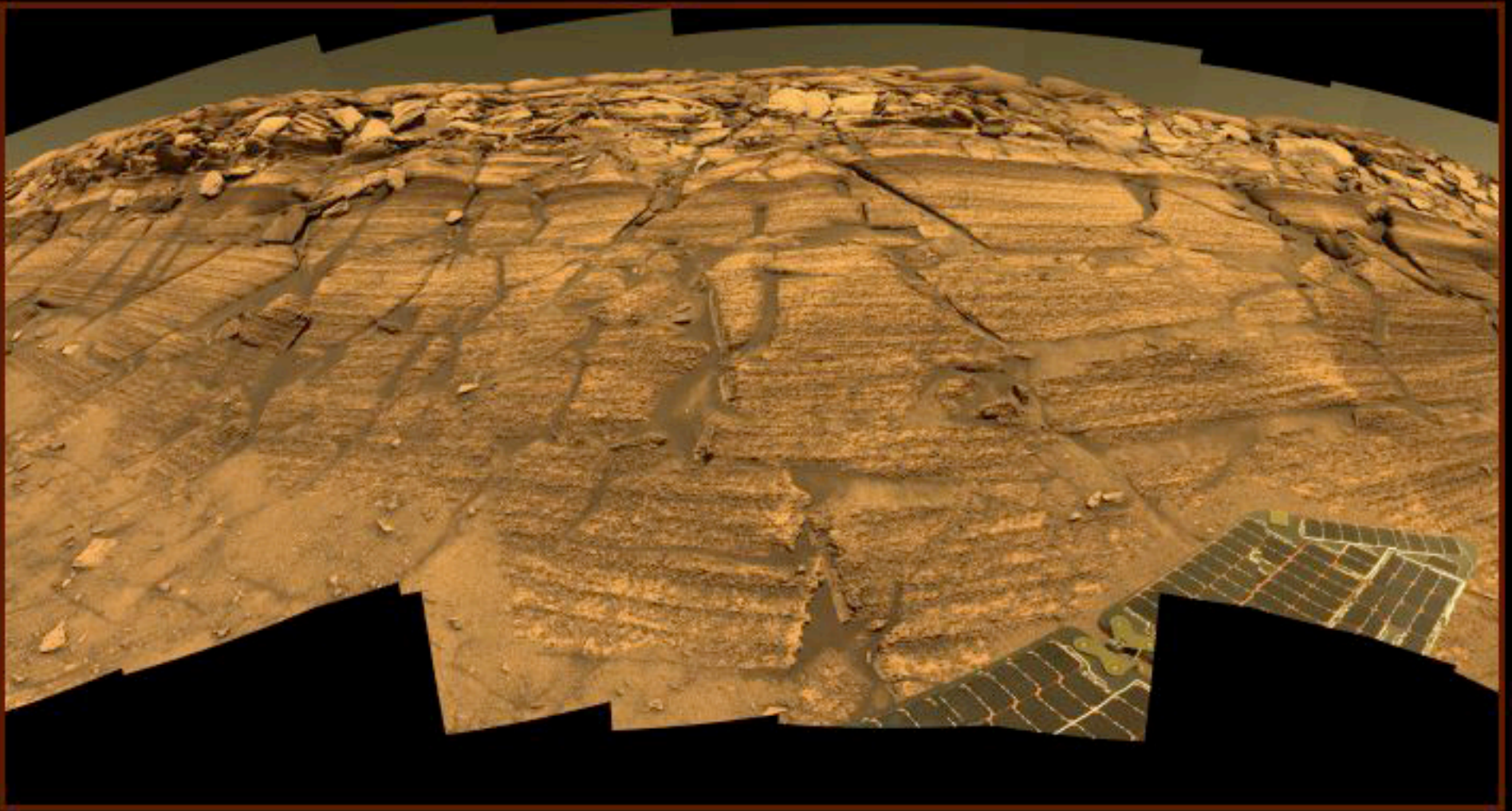
Mars Exploration Rover Mission

**Spirit
and
Opportunity**



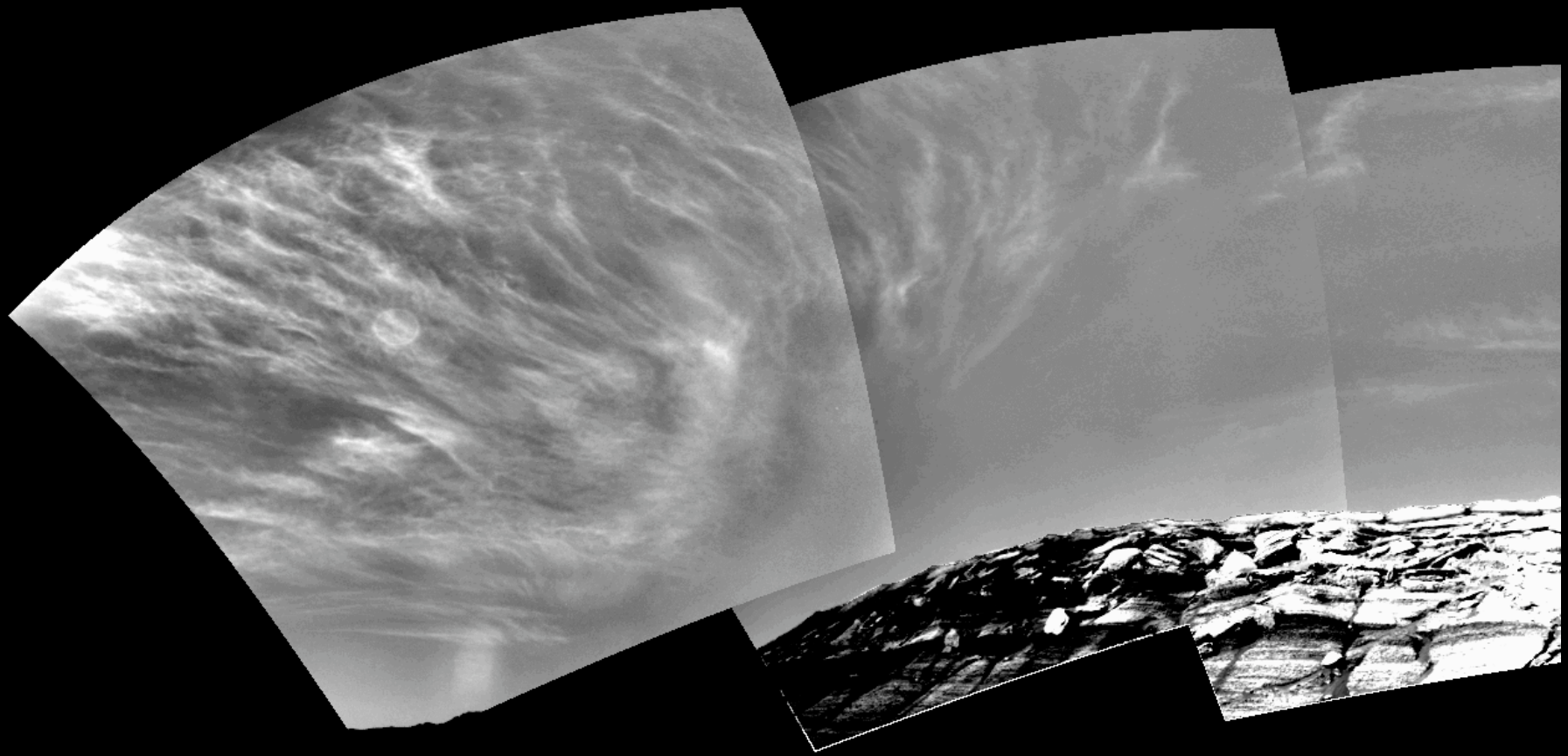
**Month in Review
November 6 - December 12**

**This month, Opportunity finished its six-month
tour of Endurance Crater.**



Panoramic camera images taken in front of "Burns Cliff" inside Endurance Crater between November 13 and 20, 2004.

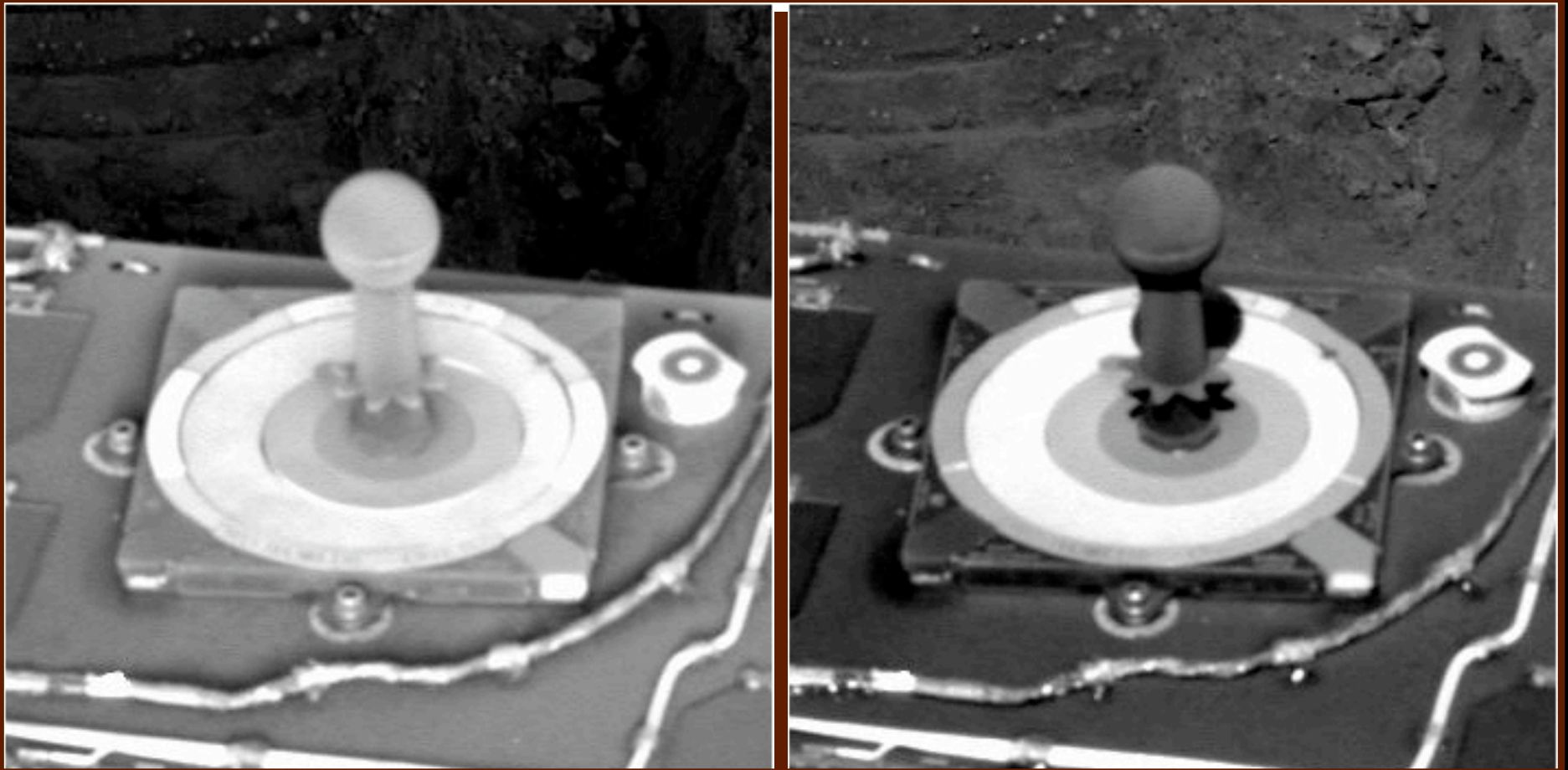
Opportunity spent the last days of fall and early winter inside Endurance, where it captured these seasonal clouds rolling overhead.



Navigation camera images taken on the morning of November 16, 2004.

**Mars has four seasons, just like Earth,
but on Mars the seasons last twice as long.**

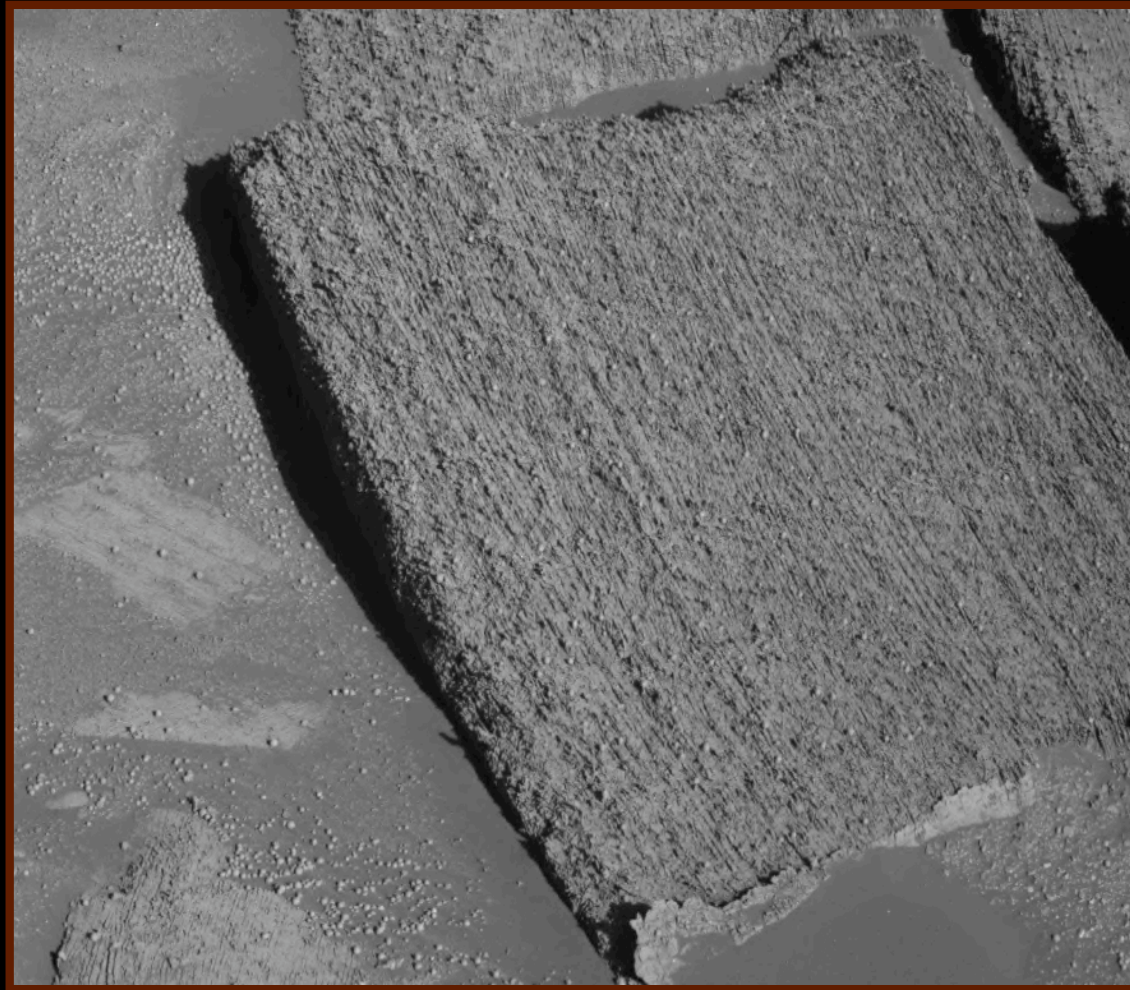
Lately, a thin frost forms on Opportunity in the mornings.



The left image taken by the panoramic camera 11 minutes after sunrise shows white frost on the calibration target, and the right image was taken three hours later on October 13, 2004, revealing the same target, but looking black and frost-free.

One theory for the rover's increased energy levels is that when the frost evaporates, some dust particles clump together on the solar panels, cleaning certain spots on them!

During the final rock investigations inside Endurance, scientists concluded that the crater was most likely not a deep-water environment, but more of a salt flat, alternately wet and dry.



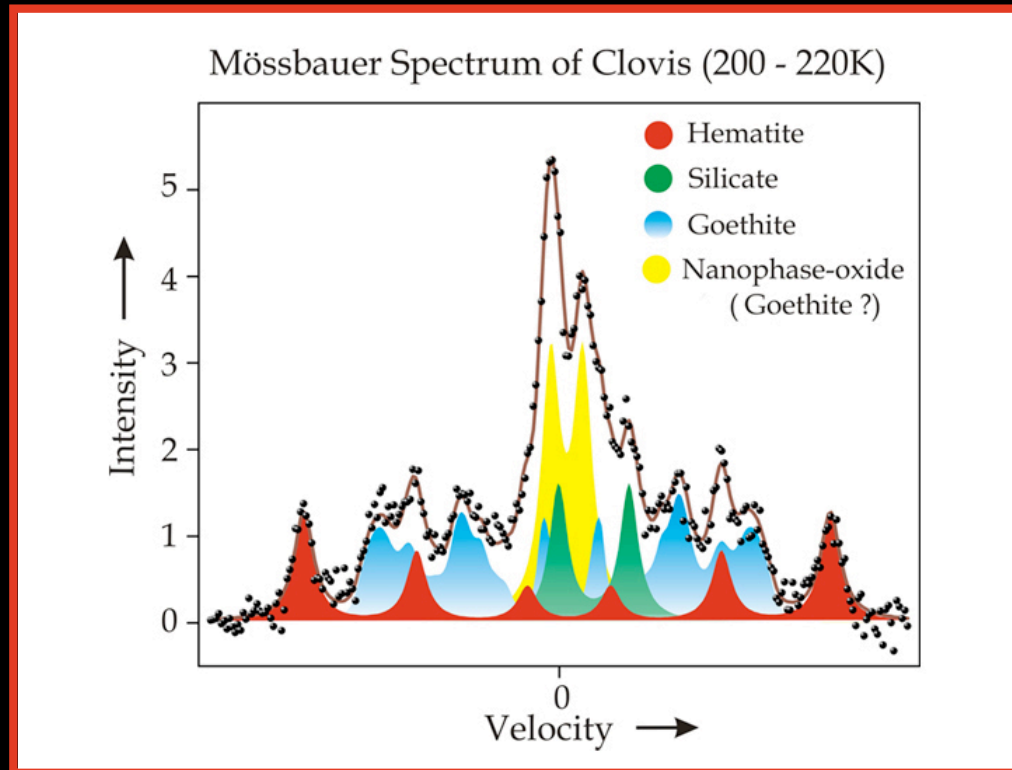
Panoramic camera image of the rock "Tipuna" taken on December 3, 2004.

**Opportunity took a farewell glance
at the stadium-sized Endurance Crater
after it successfully climbed over the rim.**



Front hazard-avoidance camera image taken during Opportunity's 315th sol, December 12, 2004.

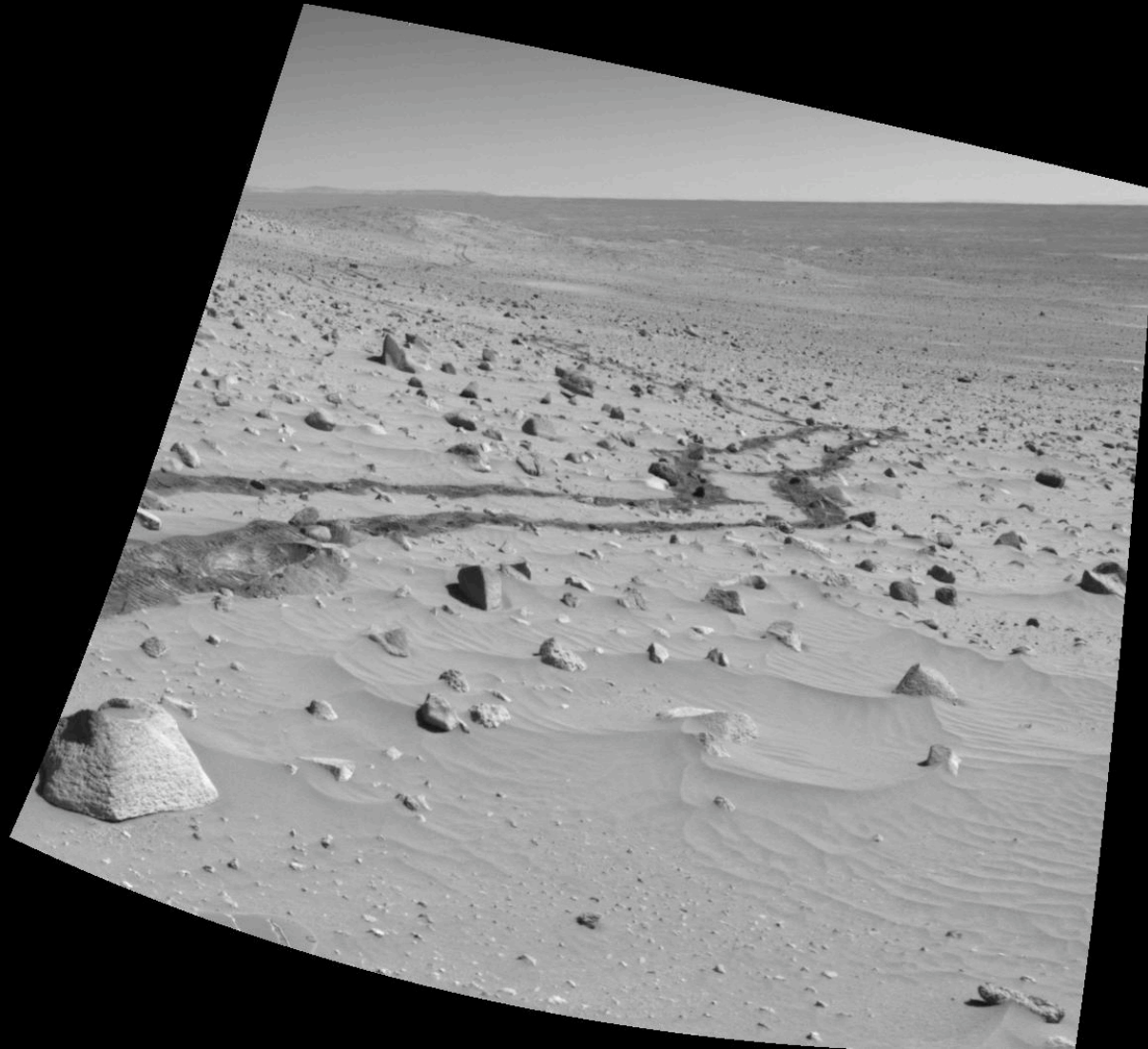
**Meanwhile, Spirit made an exciting discovery.
Scientists discovered the mineral Goethite
in a rock called “Clovis.”**



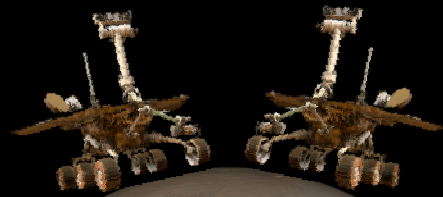
Mossbauer spectrometer spectrum showing goethite in Spirit's turf.

**Goethite forms in liquid water, and its presence
in the area where Spirit is exploring provides
strong evidence for past water activity there.**

**Spirit has also been busy
trekking across the Columbia Hills.**

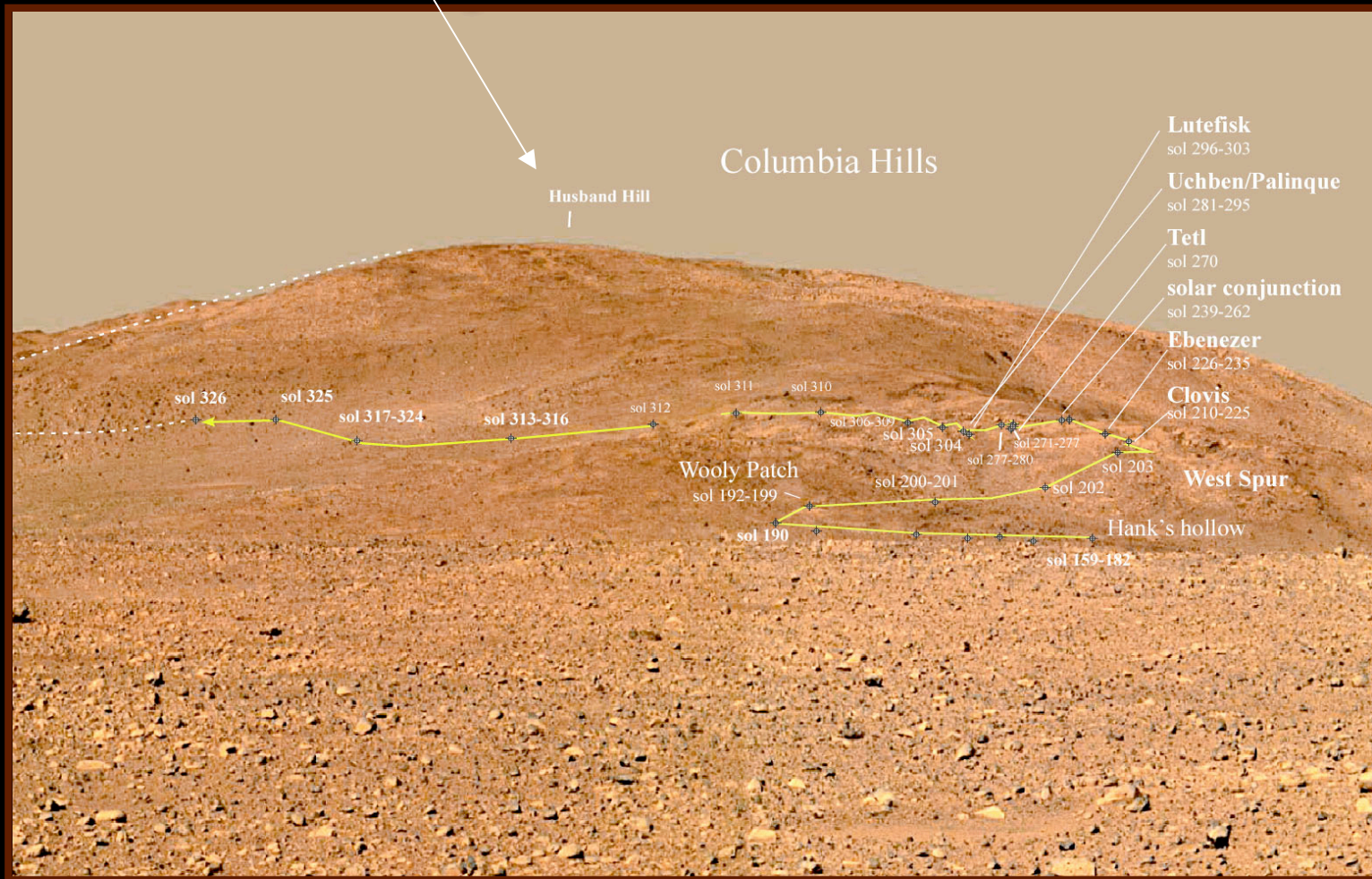


Spirit looked back at its long journey with its navigation camera on December 8, 2004.



COMING UP!

Spirit will continue heading east toward Husband Hill, while Opportunity ventures out onto the plains of Meridiani Planum.



Panoramic camera mosaic of Spirit's journey through the Columbia Hills after leaving West Spur and heading toward Husband Hill.